RK
& Associates, Inc.

April 06, 2018

R17421-3

Compliance Tracker, AE-18J
Air Enforcement and Compliance Assurance Branch
US Environmental Protection Agency - Region 5
77 W Jackson Boulevard
Chicago, IL 60604

Hard Copy via UPS Overnight
for delivery Monday April 11, 2018

Electronic copy e-mailed to
connolly.scott@epa.gov
on April 6, 2018

Hammermill Shredder Air Emissions Testing Protocol
General Iron Industries, Inc. – 1909 N. Clifton Avenue – Chicago, Illinois 60614

To Whom This May Concern:

On behalf of General Iron Industries, Inc. (General Iron), please find attached the initial Emissions Testing Protocol for measuring volatile organic compounds (VOC), particulate matter (PM), and metals emissions from the hammermill shredder at the above referenced location. This testing is being performed in accordance with the requirements specified in the United State Environmental Protection Agency's (USEPA's) *Request to Provide Information Pursuant to the Clean Air Act* (information request) dated November 14, 2017 and received by General Iron on November 27, 2017.

The attached protocol was prepared in accordance with Appendix B, Item 4 of the above referenced USEPA information request.

General Iron requests USEPA's approval of an option to use Method 320 to identify concentrations of volatile organic compounds as an alternate to Methods 25A and 18. General Iron is working with the selected testing subcontractor to determine which method is preferred. General Iron will identify the selected test method in the Notification of Intent to Test submitted no later than 21-days prior the anticipated test date.

If you have any questions, or require any additional information please do not hesitate to contact Mr. Jim Kallas, Environmental Manager for General Iron 847-508-9170 (jim@general-iron.com) or me at 630-393-9000 (jpinion@rka-inc.com).

Yours very truly,
RK & Associates, Inc.

John G. Pinion
Associate Engineer

cc: Mr. Jim Kallas – Environmental Manager – General Iron Industries, Inc. – Chicago, Illinois
Mr. Scott Connolly – USEPA – via e-mail at connolly.scott@epa.gov

Hammermill Shredder Air Emissions Testing Protocol

General Iron Industries, Inc. – Chicago, Illinois
IEPA Bureau of Air Site ID No.: 031600BTB

April 06, 2018

R17421-3

Prepared for:
General Iron Industries, Inc.
1909 N. Clifton, Avenue
Chicago, Illinois 60614

Submitted to:
Compliance Tracker, AE-18J
Air Enforcement and Compliance Assurance Branch
US Environmental Protection Agency - Region 5
77 W Jackson Boulevard
Chicago, IL 60604

RK & Associates, Inc.
2 South 631 Route 59
Suite B
Warrenville, Illinois 60555
Phone: 630-393-9000
Fax: 630-393-9111

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RK & Associates, Inc.

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EXECUTIVE SUMMARY

General Iron Industries, Inc. (General Iron) is an existing scrap metal recycling facility located at 1909 N. Clifton Avenue, Chicago, Illinois (see Figure 1). General Iron receives and shreds mixed scrap metal in various forms to produce uniform grades of ferrous and non-ferrous metals. Existing scrap handling and processing activities include receiving, sorting, shredding, metal separation and recovery of nonferrous metals, and shipping.

General Iron currently operates under an Illinois Environmental Protection Agency (IEPA) Lifetime Operating Permit (Application No. 81050001; Site ID No. 031600BTB) most recently revised and reissued on September 1, 2004.

General Iron received a *Request to Provide Information Pursuant to the Clean Air Act* (Information Request) from the United States Environmental Protection Agency (USEPA) requiring that General Iron conduct emission testing to quantify emissions for volatile organic compounds (VOC), particulate matter (PM), and metals from its hammermill shredder. Specifically, in Appendix B, Item 1 of the information request, USEPA is requiring General Iron to…

> *...perform emission testing at the facility to determine:*
>
> a. *The total gaseous organic compound emission rate as volatile organic compounds (VOC) of the hammermill shredder using EPA Reference Methods 1 – 4 and Method 25A. Methane and ethane concentrations shall be determined using Method 18 and subtracted from the total hydrocarbon concentration measured following Method 25A to determine VOC concentrations;*
>
> b. *Particulate Matter emission rate using EPA Reference Methods 1 – 4 and Method 5; and,*
>
> c. *Metal emission rates of the hammermill shredder using EPA Methods 1 – 4 and Method 29.*

The Information Request requires that:

- a test protocol be submitted no less than 45-days before testing;
- a Notification of Intent to Test be submitted not less than 21 days before testing;
- compliance testing be completed within 180 days of receipt of the Information Request; and,
- a test report be submitted within 30 days of completion of testing.

General Iron received the Information Request on November 27, 2017 and is proposing to conduct the required testing on May 22, 2018. Based on the above requirements, this Hammermill Shredder Air Emission Testing Protocol is dated and submitted on April 6, 2018 to meet the 45-day requirement.

Based on the above schedule, General Iron will submit a Notification of Intent to Test by May 1, 2018 and a test report will be submitted by June 21, 2018.

The Certification Statement required by the Information Request for all submittals is provided below.

Certification Statement:

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information including the possibility of fines or imprisonment pursuant to Section 113(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Signature: _____ Date: 4/6/18

Name: JIM KALLAS

Attachment: Hammermill Shredder Air Emission Testing Protocol
General Industries, Inc. – Chicago, Illinois
Dated April 6, 2018

1.0 INTRODUCTION

General Iron Industries, Inc. (General Iron) is an existing scrap metal recycling facility located at 1909 N. Clifton Avenue, Chicago, Illinois (see Figure 1). General Iron receives and shreds mixed scrap metal in various forms to produce uniform grades of ferrous and non-ferrous metals. Existing scrap handling and processing activities include receiving, sorting, shredding, metal separation and recovery of nonferrous metals, and shipping.

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> *...perform emission testing at the facility to determine:*
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> a. *The total gaseous organic compound emission rate as volatile organic compounds (VOC) of the hammermill shredder using EPA Reference Methods 1 – 4 and Method 25A. Methane and ethane concentrations shall be determined using Method 18 and subtracted from the total hydrocarbon concentration measured following Method 25A to determine VOC concentrations;*
> b. *Particulate Matter emission rate using EPA Reference Methods 1 – 4 and Method 5; and,*
> c. *Metal emission rates of the hammermill shredder using EPA Methods 1 – 4 and Method 29.*

The above emission testing will be performed in the exhaust duct of the hammermill shredder air handling system, downstream of a cyclone separator, a roll media filter, and the induced draft fan that pulls air from the shredder enclosure, cyclone and roll media filter. A detailed process description of the hammermill shredder and downstream emissions control equipment is presented in Section 2 of this protocol. A facility layout map showing the location of the hammermill shredder on General Iron's site is presented in Figure 2.

1.1 Facility Location

General Iron is located at 1909 N Clifton Avenue in Chicago (Cook County) Illinois as shown in Figure 1. A Facility Layout map is presented in Figure 2. Facility contact information is provided in Section 1.2 below.

1.2 Project Contact Information

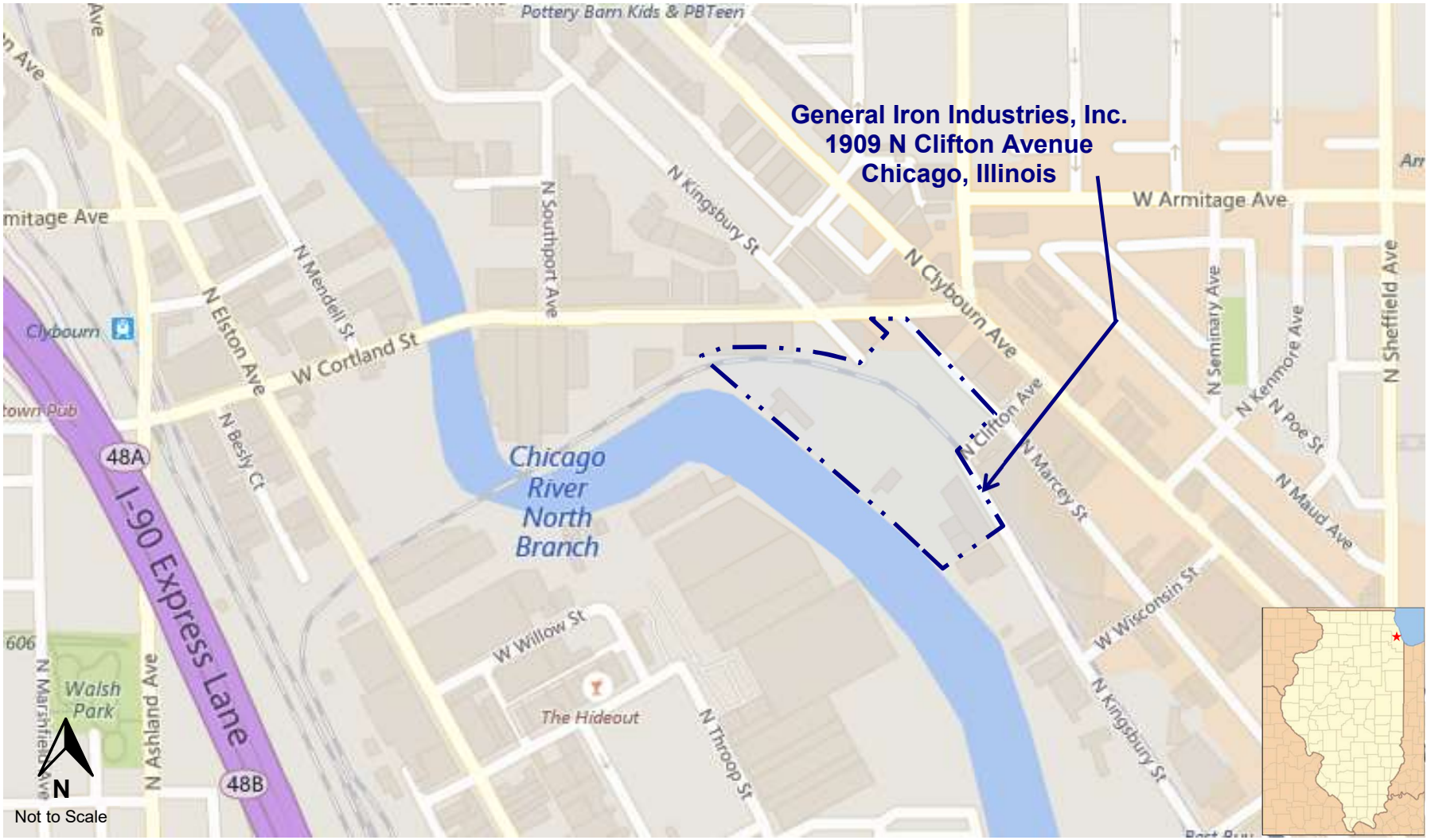
Business Name:	General Iron Industries, Inc.
Source Location:	1909 N. Clifton Avenue – Chicago, Illinois 60614 Cook County Illinois
Latitude/Longitude	41.915823° N / -87.658231" W – Intersection of N Clifton Ave. and N Kingsbury Street - Front Gate
Office/Mailing Address:	1909 N. Clifton Avenue – Chicago, Illinois 60614
General Iron Contact:	Mr. Jim Kallas - Environmental Manager 847-508-9170 – jim@general-iron.com
IEPA Site ID No.:	031600BTB
SIC Code:	5093 – Scrap and Waste Materials
NAICS Code:	423930 – Recyclable Material Merchant Wholesalers
Emission Testing Contractor	Stack Test Group 1500 Boyce Memorial Drive - Ottawa, Illinois 61350 815-433-0545
RKA Contact for Emission Testing	John Pinion - Principal Engineer 2S631 Route 59, Suite B - Warrenville, Illinois 60555 630-393-9000 jpinion@rka-inc.com

1.3 Applicable Emission Limits

The applicable regulatory limit for VOM emissions from the hammermill shredder is defined in 35-IAC 201.301 as 8-lb/hr except as provided in Section 218.302, 218.303, and 218.304 with the following exception: If no odor nuisance exits, the limitation of the Subpart shall apply only to photochemically reactive materials.

The regulatory limit for Particulate Matter is defined by the process weight rate equation in 35 IAC 212.321 and in Condition 3 of the existing Lifetime Operating Permit. The measured PM emission rate will be compared to the applicable process weight rate as defined by the documented shredder throughput rate.

There is no applicable regulatory limit for metals.



RK & Associates, Inc. 2S631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000/630-393-9111	COMMENTS: **Hammermill Shredder Air Emissions Testing Protocol**	**Site Location Map** **General Iron – Chicago, Illinois**			FIGURE 1
	DRAWN BY::	APPROVED BY::	PROJECT NUMBER	DATE DRAWN:	REVISED DATE
		JGP	R17421-3	04-2018	

RK & Associates, Inc.
2S631 ROUTE 59, SUITE B
WARRENVILLE, IL 60555
630-393-9000/630-393-9111

COMMENTS:

Hammermill Shredder
Air Emissions Testing Protocol

Facility Map
General Iron Industries, Inc.
1909 N Clifton Avenue - Chicago, Illinois

FIGURE: 2

DRAWN BY:	APPROVED BY:	PROJECT NUMBER:	DATE:	REVISED DATE:
	JGP	R17421-3	04-2018	

2.0 PROCESS DESCRIPTION AND PROPOSED OPERATING PARAMETERS

The following information presents a process description of the hammermill shredder and the operating parameters for testing.

During testing conducted under this protocol, process equipment will be operated at maximum throughput rates (350-500 tph) using representative feed material and representative operating conditions.

Emission testing will be performed by Methods 1 through 4 for flow rate and moisture, Method 25A and 18 (or Method 320 as an alternate) for VOC emissions, Method 5 for PM and Method 29 for metals. Additional information on the proposed sampling methods is presented in Section 3.

A flow diagram of the shredder is presented in Figure 3.

2.1 Hammermill Shredder

The hammermill shredder has a maximum design capacity of up to 500-tons per hour of scrap metal. The actual shredder feed rate is dependent on the type and consistency of the feed material and the ability to consistently feed the scrap to the shredder. During the testing, a feed rate of 350 to 500-tph is anticipated.

Typical feed to the shredder consists approximately 20% end of life vehicles and 80% general scrap metal. Shredded metal is discharged by conveyor and directed to a Z-Box separator. In the Z-Box separator, shredded metal passes through a rising column of air. A fan and ducting system maintains an upward flow of air through the Z-Box (counter current to the direction of the shredded metal). Shredded metal falls downward through the rising column of air and is discharged at the bottom of the Z-Box over a conveyorized belt scale. The belt scale measures the mass of shredded metal produced and this value will be used to identify the process throughput rate of the shredder.

Downstream of the belt scale, a drum magnet separates ferrous from nonferrous metal. The ferrous and nonferrous metal streams are then conveyed to storage piles.

The upward flow of air through the Z-Box removes light material. The air stream carries this light material to an integral cyclone that disengages the material form the air stream. Light material is discharged from the bottom of the cyclone where it is collected for further processing. The air discharged from the top of the cyclone is recycled through the fan, back to the bottom of the Z-Box.

The shredder throughput is measured by a calibrated belt scale located following the discharge of the Z-Box separator. This belt scale measures the mass rate of shredded metal discharged from the unit.

The shredder is equipped with an integral water injection system to minimize the potential for fires and explosions within the shredder. The shredder is located within an enclosure consisting of curtain walls on four sides, and solid plate and metal grating on the roof. The purpose of the metal grading is to provide pressure relief and reduce the potential for metal debris from leaving the enclosure in the event of an upset condition.

The shredder is located within an enclosure, equipped with an exhaust hood, and is surrounded by rubber curtains to enhance emissions capture efficiency. Ambient air pulled through the shredder is discharged through the cyclone and then through a roll media filter. An induced draft fan downstream of the roll media filter pulls ambient air through the shredder, cyclone, and roll media filter before being discharged to the atmosphere.

There are a set of standard 4-inch diameter test ports located downstream of the induced draft fan on the 42-inch diameter horizontal ducting. Safe access to the test ports is provided by scaffolding and/or a man lift.

The anticipated exhaust duct flow characteristics are shown below.

Parameter	Value
Duct Diameter (in)	42
Exhaust Gas Temperature (°F)	84.9
Exhaust Gas Moisture (%)	1.69
Exhaust Gas Flow (ACFM)	28,400
Exhaust Gas Flow (DSCFM)	26,354

Hammermill Shredder Flow Diagram

A. Shredder Feed Conveyor
B. Shredder Enclosure
C. Z-Box
D. Z-Box Cyclone
E. Shredder Exhaust Cyclone
F. Shredder Exhaust Roll media filter and Induced Draft Fan
G. Test Ports on Horizontal Duct
H. Belt Scale

RK & Associates, Inc. 2S631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000	COMMENTS: Hammermill Shredder Air Emissions Testing Protocol	Hammermill Shredder Flow Diagram General Iron Industries, Inc. – Chicago, Illinois			FIGURE 3
	DRAWN BY::	APPROVED BY:: JGP	PROJECT NUMBER R17421-3	DATE DRAWN: 04-2018	REVISED DATE

2.2 Shredder Operating Parameters

The following describes the operating parameters, identified in the Information Request, that will be monitored and recorded during testing.

- Shredder Throughput

  The shredder throughput will be measured by a calibrated belt scale after Z-Box separator. The mass flow over the bent is continuous recorded by the shredder data collection system.

  The number of vehicles shredded during each test will be manually counted and recorded. Each auto body is assigned an average weight. The total calculated weight of vehicles processed during each test run will be manually calculated. The mass of mixed scrap metal shredded will be determined by subtracting the total mass vehicles shredded from the total mass of metal measured by the belt scale during each test run.

- Shredder Water Injection Rate

  The water injection rate will be monitored by a flow meter downstream of the water feed pump. Water flow rate is continuously recorded by the shredder data collection system.

- Shredder Amperage

  The shredder motor amperage is monitored by an amp meter in the motor control system. Motor amperage is continuously recorded by the shredder data collection system.

- Other Parameters

  Data from other system operating parameters that are monitored as part of normal operation, will also be continuously recorded by the shredder data collection system. A summary of the available data will be included in the Test Report.

3.0 TEST METHODS

The following is a brief description of the test methods that will be used to verify that the proposed methods are consistent with the requirements of the Information Request.

3.1 Method 1 – Sample and Velocity Determination

Sampling traverse points will be determined based on the ratio of the stack diameter to the upstream and downstream distances of the sampling plane to the closest disturbances. The minimum number of traverse points on the sampling plane will be determined from Figure 1-2 and Table 1-2 of 40 CFR 60, Appendix A, Reference Method 1.

3.2 Method 2 – Volumetric Flow Rate Determination

The average velocity of the stream will be determined from differential pressure readings at each traverse point using a Type-S pitot tube and inclined manometer and the gas temperature using a calibrated type "K" thermocouple probe connected to a digital thermocouple indicator. The pitot tube will be constructed per Method 2 design specifications and a correction coefficient of 0.84 will be assigned. Volumetric flow rates will be calculated to dry, standard conditions. If Method 2A is used, a Type-P pitot tube with a coefficient of 0.99 will be used.

3.3 Method 3 – Oxygen (O_2)/Carbon Dioxide (CO_2) Determination

Gas composition for oxygen, carbon dioxide, and nitrogen will be determined employing EPA Method 3. An integrated gas sample will be collected during each test. Gas analysis will be conducted using a calibrated Servomex Model 1440C O2/CO2 analyzer.

3.4 Method 4 - Determination of Moisture Content

The exhaust gas moisture content will be determined using EPA Method 4 for all tests. Moisture content will be determined by drawing the gas sample through four impingers in the sample train. Volumetric analysis will be used to measure the condensed moisture in the first three impingers while gravimetric analysis of silica gel will be used to measure moisture collected in the fourth impinger.

3.5 Method 5 Particulate Matter – Stationary Sources

3.5.1 Sample Collection

Particulate emissions will be determined following the guidelines of USEPA Reference Methods 1,2,3,4 and 5. These Methods are titled:

Method 1 Sample and Velocity Traverses for Stationary Sources

Method 2 Determination of Stack Gas Velocity and Volumetric Flow Rate (Type "S" Pitot Tube)

Method 3	Gas Analysis for Carbon Dioxide, Oxygen, Excess Air and Dry Molecular Weight
Method 4	Determination of Moisture Content from Stationary Sources
Method 5	Determination of Particulate Emissions from Stationary Sources

These methods appear in detail in Title 40 of the Code of Federal Regulations (CFR), Part 60, Appendix A.

The Method 5 sampling train will consist of the following components.

1. Appropriately sized nozzle.
2. Sample probe with heated borosilicate glass liner.
3. Heated glass fiber filter.
4. Four impingers in an insulated ice water bath in the following sequence:
   A. Modified Greenburg-Smith design containing 100 ml DI H_2O.
   B. Greenburg-Smith design containing 100 ml DI H_2O.
   C. Modified Greenburg-Smith design empty.
   D. Known amount of silica gel.
5. Sampling gas measuring system.

3.5.2 Sample Duration and Frequency

The Method 5 train samples will be collected in triplicate on the stack, with each test lasting approximately 60 minutes in duration. A minimum sample size of 30 dry standard cubic feet (dscf) will be collected for each test.

3.5.3 Sample Recovery

Upon completion of each test, the sampling train will be removed from the stack. The probe, nozzle, and prefilter glassware will be rinsed and brushed a minimum of three times with acetone, and placed into a labeled container. The filter will be placed into a separate container. The impingers will be weighed for moisture gain.

3.5.4 Analytical Procedures

The total particulate mass will be determined by adding the weight of the particulate from the probe, prefilter wash with the particulate on the filter.

The acetone wash containing the particulate from the probe wash and prefilter glassware will be placed into a tared beaker, evaporated to dryness, desiccated for 24 hours, then weighed in 6 hour intervals to a

constant weight. An acetone blank will also be analyzed and subtracted from the particulate weight of the acetone wash.

The tared glass fiber filter will be desiccated for 24 hours, then weighed every six hours to a constant weight.

3.5.5 Blanks

Blanks for the Method 5 train will be prepared by recovering an acetone sample in the same manner listed above.

3.5.6 Calibrations

All sampling equipment will be calibrated according to the procedures outlined in EPA Reference Method 5.

3.6 Metals

3.6.1 Sample Collection

Metals emissions will be determined following the guidelines of USEPA Reference Methods 1,2,3,4 and 29. These Methods are titled:

Method 1	Sample and Velocity Traverses for Stationary Sources.
Method 2	Determination of Stack Gas Velocity and Volumetric Flow Rate (Type "S" Pitot Tube).
Method 3	Gas Analysis for Carbon Dioxide, Oxygen, Excess Air and Dry Molecular Weight.
Method 4	Determination of Moisture Content from Stationary Sources.
Method 29	Determination of Metals Emissions from Stationary Sources.

These methods appear in detail in Title 40 of the Code of Federal Regulations (CFR), Part 60, Appendix A. There is a potential high bias for manganese from the potassium permanganate in the Method 29 sampling train.

The Method sampling train will consist of the following components.

1. Appropriately sized borosilicate glass nozzle.
2. Sample probe with heated borosilicate glass liner (Heated to 248°F $\pm$ 25°F).
3. Heated Teflon filter with Teflon frit.

4. Five impingers in an insulated ice water bath in the following sequence:
   A. Greenburg-Smith design containing 5% HNO_3/10% N H_2O_2.
   B. Modified Greenburg-Smith design containing 5% HNO_3/10%.
   C. Modified Greenburg-Smith design empty.
   D. Known amount of Silica Gel.
5. Sampling gas measuring system.

3.6.2 Sample Duration and Frequency

The Method 29 train samples will be collected in triplicate, with each test lasting approximately 120 minutes in duration. A minimum sample size of 60 dry standard cubic feet (dscf) will be collected for each test.

3.6.3 Sample Recovery

Upon completion of each test the sampling train will be removed from the stack. The probe, nozzle, and prefilter glassware will be rinsed and brushed a minimum of three times with 0.1 N nitric acid and placed into a labeled container. The filter will be placed into a separate container. The contents of impingers 1, 2 & 3 will be weighed for moisture gain and placed into a sample container. The impingers will then be rinsed with 0.1 N nitric acid and the rinses will be placed into the same sample container. The silica gel will be weighed for moisture gain.

3.6.4 Analytical Procedures

The metals samples will be analyzed as per the procedures outlined in Method 29.

3.6.5 Blanks

Blanks for the Method 29 train will be prepared by recovering the sample train in the same manner listed above. Additionally, an audit sample will be analyzed for the metals and included in the final report.

3.6.6 Calibrations

All sampling equipment will be calibrated according to the procedures outlined in EPA Reference Method 29.

3.6.7 Method 29 Audit Samples

In accordance with the requirements of the Stationary Source Audit Sample (SSAS) Program, two audit samples, one filter sample, and one liquid sample will be obtained from ERA in Golden, Colorado. ERA will send a description of the recommended audit samples to USEPA Region V for approval. Upon approval, the samples will be sent directly to the laboratory that will conduct the analysis of field samples collected during the test program described in this document.

The laboratory will handle, store and analyze each audit sample in the same batch and in the same manner as the stationary source test samples for the test method and analytes being audited. Audit samples will be prepared for analysis in accordance with the procedures specified by ERA. The laboratory shall use the same personnel, sample tracking, sample storage, preparation, analysis's methods, equipment, materials, standard operating procedures, calibration techniques, quality control procedures, and quality control acceptance criteria for the stationary source test samples and the audit samples.

The laboratory will report audit sample results to ERA and simultaneously report the stationary source test laboratory results and the audit sample results to the USEPA.

The laboratory will keep records regarding the analysis of audit samples and make them available for review upon request for a minimum of five years.

3.7 Volatile Organic Compound

3.7.1 Sample Collection

Testing on the exhaust stack of the shredder will be performed using U.S. EPA Method 25A. A J.U.M. Model VE-7 Flame Ionization Detector (FID) will be used to determine the emission concentrations. A sample will be transported through a heated Teflon line (heated to 350°F) from the inlet and outlet ducts to the FID, which will analyze the sample continuously. The output signal from the FID will then be recorded on a datalogger at one-minute averages throughout the test. Copies of this data will be included in the final report.

At the beginning of the test series, the analyzer will be calibrated and then checked for calibration error by introducing zero, low-range, mid-range and high-range calibration gases to the back of the analyzer. Before and after each individual test run, a system bias will be performed by introducing a zero and mid-range propane calibration gas to the outlet of the probe. Calibration gases used will be U.S. EPA Protocol 1 certified. Volatile Organic Compounds will be measured by either Method 25A and Method 18, as identified in the Information Request, or by Method 320, at General Iron's discretion, as an alternate method.

3.7.2 Sample Duration and Frequency

The Method 25A samples will be collected in triplicate on the exhaust stack of the shredder, with each test lasting sixty minutes in duration.

3.7.3 Calibrations

At the beginning of the test series, the analyzer will be calibrated and then checked for calibration error by introducing zero, low-range, mid-range and high-range calibration gases to the back of the analyzer. Following each test, a system bias will be performed by introducing a zero and mid-range calibration gas to the outlet of the probe. Calibration gases used will be U.S. EPA Protocol 1 certified.

All calibration gases will be propane. The analyzer calibrations, along with the protocol gas certification sheets, will be included in the final report.

3.7.4 Data Reduction

The analyzer outputs will be recorded on a datalogger and laptop computer. These one-minute datalogger readings will then be averaged using an Excel spreadsheet. The raw datalogger readings will be included in the final report. All VOM results will be reported in terms of parts per million as propane and pounds per hour.

3.7.5 Methane/Ethane Analysis

If methane/ethane is suspected, a Tedlar bag will be sampled and analyzed for methane/ethane concentration. The Tedlar bag samples will be taken at the bypass fitting on the FID. The samples will be integrated throughout the hour test. The samples will be sent to an accredited laboratory for methane/ethane analysis using Method 18, and the results included in the final report.

3.8 Method 320 – Vapor Phase Organic and Inorganic Emissions by Extractive FTIR

3.8.1 Sample Collection

A gas sample will be collected continuously from the shredder exhaust and directed to the FTIR by way of a heated sampling line that will be maintained at approximately 150°C. The sample will be passed through a heated probe/filter assembly and then to the FTIR. The FTIR will use a temperature-controlled, 5.6-meter multi-pass gas cell also maintained at 150°C. The sample system withdraws the sample gases continuously at 10-L/min. The data will be collected at 0.5cm-1 resolution. Each spectrum will be derived from the co-addition of 128 scans with data points generated every 80 seconds. The FTIR will be calibrated with an acetaldehyde calibration gas mixture.

FTIR technology works on the principle that most gases absorb infrared light. This is the case for all compounds with the exception of homonuclear diatomic molecules and noble gases such as N2, O2, H2, He, Ne, and Ar. Vibrations, stretches, bends, and rotations within the bonds of a molecule determine the infrared absorption distinctiveness. The absorption creates a "fingerprint" which is unique to each compound. The quantity of infrared light absorbed is proportional to the gas concentration. Most compounds absorb infrared light at different infrared frequencies, which allows for the simultaneous analysis of multiple compounds.

3.8.2 Sample Duration and Frequency

The Method 320 samples will be collected in triplicate on the exhaust stack of the shredder with each test lasting sixty minutes in duration.

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4.0 PROJECT PERSONNEL

The Stack Test Group will provide the necessary personnel to collect samples.

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5.0 TEST SCHEDULE

The schedule includes one day for mobilization to the facility (May 21, 2018) and one to two days to perform the required testing beginning on May 22, 2018.

The number of days required to complete the testing will be dependent on facility operations and equipment-related delays that may occur.

The required pre-test notification will be sent to USEPA as required, 21-days prior to the proposed test date.

A test report will be submitted within 30 days of completion of testing.

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6.0 QUALITY ASSURANCE PROCEDURES

The testing contractor recognizes the previously described reference methods to be very technique oriented and attempts to minimize all factors that can increase error by implementing its Quality Assurance Program into every segment of its testing activities.

Copies of all pertinent calibration data (calibration gas certifications, Pitot tubes, dry gas meters, nozzles, etc.) will be given to the on-site observer from the observing agency prior to testing and included in the final test report.

Calculations are performed by computer. An explanation of the nomenclature and calculations, along with the complete test results, will be appended in the final report. Also to be appended, are the calibration data and copies of the raw field data sheets. Analyzer interference data is kept on file.

All the data necessary for the agency to reproduce the reported results will be included in the final test report. The data shall include, but not be limited to DAS printouts, calibration data, uncorrected run averages, raw lab analysis (including chromatograms, spectra or other instrument output, and calibration and QA/QC data) with summary tables, and raw field data.

Dry gas meters are calibrated according to methods described in the Code of Federal Regulations. The dry test meters measure the test sample volumes to within 2 percent at the flowrate and conditions encountered during sampling.

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7.0 TEST REPORT

Within 30 days after completion of testing, a test report shall be submitted that will, at a minimum, include the following information in accordance with Appendix B, Item 7 of the Information Request.

a. Summary of Results:
   i. results of above specified emission test(s);
   ii. process and control equipment data recorded during the tests;
   iii. discussion of any errors that occurred during testing;
   iv. discussion of any deviations from the reference test methods or other problems encountered during the test; and,
   v. data on production rate during testing.

b. Facility Operations:
   i. description of process and control equipment in operation during the tests;
   ii. operating parameters of the control equipment in operation during the tests; and,
   iii. facility operating parameters and data, including an explanation of how the operating parameters demonstrate that the process units were operating at greater than 90% production capacity at the time of the testing.

c. Sampling and Analytical Procedures:
   i. sampling port location and dimension of cross-section;
   ii. sampling point description, including labeling system;
   iii. brief description of sampling procedures, including equipment and diagram;
   iv. description of sampling procedures (planned or accidental) that deviated from any standard method;
   v. brief description of analytical procedures, including calibration;
   vi. description of analytical procedures (planned or accidental) that deviated from any standard method; and,
   vii. quality control/quality assurance procedures, tests, and results.

d. Appendixes:
   i. complete test results with calculations;
   ii. raw field data;
   iii. laboratory reports with signed chain of custody forms;
   iv. calibration procedures and results;
   v. raw process and control equipment data signed by plant representative;
   vi. test log(s) and,
   vii. project participants and titles.

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